REMARKS

In the pending office action, claims 1-5, 7-10, 16, 17 and 87 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kang *et al.* Claims 1-3, 7-9, 16, 17 and 87 were also rejected under 35 U.S.C. §103(a) over Swift *et al.*

Claims 1, 9 and 10 are amended herein. Claim 1 has been amended to add silver into the list of potential metals that can be used in the freestanding particles of the present invention. Silver was inadvertently omitted from the list when the claim was previously submitted, and is supported in originally filed claim 13 and throughout the specification. Claims 9 and 10 have been amended to require that at least one of the segments of the freestanding particles have a length from 50 nm to 15 μm.

A further Supplemental Information Disclosure Statement and Form 1449 is submitted herewith. The references included were cited by the Australian Patent Office in the corresponding Australian application. These references, directed to "giant magnetoresistance" in nanowires, is cumulative of references already of record in this case.

The Examiner's interpretation of the terms "particle" and "freestanding", as found in the claims, are not consistent with the Specification. In Kang *et al.*, a support member or substrate is integral with a large number of surface features that the Examiner appears to consider "particles." See, for example, Kang *et al.*, at column 7, lines 1-3, where the described process yields "an array of diamond emitters 25 arranged monolithically on an integral diamond substrate 30." A review of Figures 1b, 2b, 3b, 4b, 7b, 8b, 9, 11a, and 11b, etc. illustrates this point. Swift *et al.* discloses an array of integral conductive fibers that are encased in a metal matrix where some of the matrix has been removed to expose the tips of the fibers (See col. 5, lines 17-19.) Neither reference describes freestanding particles as set forth in the present invention.

The claimed invention relates to "freestanding particles ... wherein the particle length is from 20 nm to 50 μm and the particle width is from 5 nm to 50 μm." The limitation "freestanding" requires that particles that are produced by some form of deposition or growth within a template have been released from the template. Page 14, lines 30-31. The freestanding particles of the present invention are not part of an array of

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fibers or structural features.

In discussing the Kang *et al.* reference, the Examiner acknowledges that the microtip structures are fabricated as part of a sheet of material, and therefore are not physically discrete bodies but merely features of the larger sheet. Under the Examiner's analysis, however, the microtips qualify as particles because they are "separately recognized as specific structures throughout the reference and therefore are disclosed specifically and separately albeit fabricated on a sheet of support material." This analysis is flawed. The fact that the microtip structures are "separately recognized as specific structures" does not make them particles according to the present invention. Such a definition is inconsistent with any conventional use of the term "particle," as well as the specific use of the term in the present application.

The microtip structures of Kang *et al.* might conceivably be "particles" according to the present invention if they were somehow severed from the substrate of which they are an integral part – something that is neither disclosed nor suggested in the reference. By the same token, the fibers of Swift *et al.* might be particles if they were somehow detached from the composite membrane to which they are attached. Again, this is not done or suggested in the reference.

The prior art references cited by the Examiner do not teach "particles" at all, let alone the "freestanding particles" required by the claims.

Claim 1 of the present invention is directed to particles having a length of from 20 nm to 50 μm and width from 5 nm to 50 μm. Figure 1 of the present invention was provided, in part, in order to demonstrate how to determine the length and width of particles that fall within the scope of the present invention. Unless the microtip structures of Kang *et al.* or the fiber tips of Swift *et al.* are separated from the substrate to which they are attached, they could not be given dimensions of height and width to determine if they fell within the scope of the claims.

Neither reference cited by the Examiner discloses a particle as required by Claim 1 of the present invention. Such references, therefore, can not obviate the present invention.

A number of ways are disclosed in the Specification concerning how to fabricate

the freestanding particles of the present invention, one of which is template-directed. For example, a preferred embodiment is electrodeposition into a template. The specification indicates that the particles of the invention made in such a manner (i.e., in a template) are released from the template. Example 1 of the application describes the production of freestanding particles of the present invention. The steps of the process can be summarized as follows:

i) a silver layer is evaporated in the branched pore side of an aluminum membrane;

ii) silver is electroplated into both sides (branched and non-branched) of the aluminum membrane;

iii) multiple layers of gold and silver are electroplated into the non-branched side of the alumina membrane, with the evaporated silver plug serving as electrode for the electroplating;

iv) the "evaporated silver layer (and the electrodeposited silver in the branched pores)" is removed by dissolution in 6 M nitric acid; and

v) the particles are then removed from the alumina membrane by dissolving in .5 M NaOH.

The result of this process is not an array of fibers or structural features attached to a common substrate, but "freestanding particles." Neither Kang *et al.* or Swift *et al.* teach or suggest freestanding particles as required by the claims.

In addition, contrary to the Examiner's assertion regarding Swift *et al.*, the fibers are not formed in or released from a template or "mold." The only "mold" disclosed is what contains the entire composite while the molten metal poured over the fibers solidifies. Col. 7, lines 35-41. Similarly, the fibers are freed not from a mold in which they were formed, but from the metal matrix that was formed around them. Col. 8, lines 10-21. Significantly, this process of "fibrillating" does not sever the exposed tips of the fibers; rather it selectively removes the metal matrix.

Finally, the Examiner's contention that the arrays of Kang *et al.* and Swift *et al.* obviate the present invention is wholly inconsistent with all of the uses of the segmented particles of the present invention set forth in the specification. A plurality of segmented

structures attached to a common substrate no longer has the benefits of the particles of the present invention. It is the use of discrete, nanometric sized particles that provide the power of the present invention. For example, the free standing particles are used in multiplexed bioassays and contain abundant disclosure about their "independent assortment".

Applicants believes that the claims are patentable over the prior art of record. Because of the importance of this case, the Examiner is encouraged to contact the undersigned if any further issues arise that could delay allowance of this case.

This constitutes a request for any needed extension of time and an authorization to charge all fees therefore to deposit account No. 19-5117, if not otherwise specifically requested.

Respectfully submitted,

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Barry J. Swanson, #33,215
Swanson & Bratschun, L.L.C.
1745 Shea Center Drive, Suite 330
Highlands Ranch, Colorado 80129
Telephone: (303) 268-0066
Facsimile: (303) 268-0065

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